

REMARKS

The application is believed to be in condition for allowance for the reasons set forth below.

Claims 17-25, 27, 28, 33, 34, 36 and 37 were previously pending in the application. New claims 38 and 39 are added. Therefore, claims 17-25, 27, 28, 33, 34 and 36-39 are presented for consideration.

Claims 17-25, 27, 33-34 and 36 were rejected under 35 USC §103(a) as being unpatentable over KURITA U.S. Publication No. 2002/0135057 in view of MATSUMURA U.S. Publication No. 2003/0101584. That rejection is respectfully traversed.

The Official Action recognizes that KURITA does not disclose that the projection electrode has a sharp tip. MATSUMURA is offered for this feature with the Official Action concluding that it would have been obvious to modify KURITA in view of MATSUMURA in order to provide desirable contact with electrical parts.

However, the proposed combination of references is believed to be untenable for at least the following reasons.

First, the proposed combination of references disregards the claimed invention as a whole.

The Federal Circuit has held that in determining the differences between the prior art and the claims, the question under 35 USC 103 is not whether the differences themselves would have been obvious, but whether the claimed invention as a whole

would have been obvious. *Stratoflex, Inc. v. Aeroquip Corp.*, 713 F.2d 1530, 218 USPQ 871 (Fed. Cir. 1983).

In the present case, the recited projection electrode having a sharp tip is within the insulating resin layer as part of a stacked device and is connected to a wiring layer. Thus, the device of the present invention includes the electrode having a permanent connection to a wiring layer.

In contrast, the bump of MATSUMURA has momentary contact with an electrical part. MATSUMURA discloses a conical-shaped bump being an exposed element that is part of a probe card. See Figure 1, element 25 and paragraph [0021] of MATSUMURA.

Moreover, MATSUMURA does not require a conical shape. See claims 1, 2, 4-11, 13-21 and 23-25 of MATSUMURA.

One of ordinary skill in the art looking to improve upon a permanent connection of a bump to a wiring layer would not look to MATSUMURA for this teaching.

The present inventors use a pointed electrode, for example, in order to penetrate the resin during assembly of the device. As KURITA adds his resin (step 2C) after the bumps 2 are connected to the wiring layer 3 (step 2B), there is no need to have a pointed electrode.

Thus, when the claimed invention is viewed as a whole, the claimed invention would not have been obvious over the proposed combination of references.

Second, the rationale set forth in the Official Action does not support the legal conclusion of obviousness, in that there is no support for the assertion that the tip portion of MATSUMURA in fact provides a desirable permanent contact with electric parts.

As set forth above, MATSUMURA is directed to bumps on a probe card. Such bumps make a momentary contact with an electrical part in order to form an electrical path for validating the electrical part. Once the part is validated (or invalidated), the probe is moved to the next electrical part.

For such a device, it might be desirable to use a conical-shaped electrode, because such an electrode repeatedly forms a good contact as the probe is moved from wafer to wafer or electrical part to electrical part.

In contrast, KURITA places an electrode in permanent contact with a wiring layer by a standard flip-chip type connection.

There is no suggestion in MATSUMURA that a conical-shaped bump would be effective (desirable) for flip-chip type permanent connection of KURITA.

Accordingly, it would not have been obvious to one of ordinary skill in the art to modify the electrode of KURITA in the manner suggested. Therefore, claims 17-25, 27, 33-34 and 36 are believed to be patentable over the proposed combination of references.

Claims 28 and 37 were rejected under 35 USC 103(a) as being unpatentable over KURITA in view of SAKAMOTO et al. 6,791,199. That rejection is respectfully traversed.

SAKAMOTO is only offered with respect to a thermosetting resin. SAKAMOTO does not disclose an electrode having a sharp tip as recited in claims 17 and 23. As recognized in the Official Action, KURITA does not disclose an electrode having a sharp tip as recited in claims 17 and 23. Since claims 28 and 37 depend from claims 17 and 23, respectively and further define the invention, these claims are believed to be patentable at least for depending from an allowable independent claim.

New claims 38 and 39 are added. These claims depend from claims 17 and 23, respectively and further define the invention, and are believed to be patentable at least for depending from an allowable independent claim. Support for the new claims can be found at least in Figure 7B.

In addition, the present application discloses that the second wiring layer is used as a ground layer in order to reduce the influence of noise. It is generally well-known that it is necessary to adjust an interval between the first wiring layer and the second wiring layer, that is, a characteristic impedance in order to obtain effect of the above ground layer. The value of the above interval is 10 μ m to 60 μ m as regards a general wiring substrate. Furthermore, the thickness of a general chip is 100 μ m to 750 μ m, and the thickness of a general projection electrode is

50µm to 300µm. Therefore, it is advantageous that the second wiring layer is disposed below the top surface of the chip which is mounted on the wiring substrate.

In contrast, in KURITA, it is necessary to expose the top surface of post 6 in order to form second wiring layer 14. Since the top surface of post 6 is exposed by grinding the top surface side of chip 1, the top surface of post 6 is arranged at the same level as the top surface of chip 1 or higher than that level. Thus, in the invention of KURITA, second wiring layer 14 is not disposed below the top surface of chip 1, and there is no suggestion to arrange the device of KURITA in this manner.

In view of the foregoing remarks, it is believed that the present application is in condition for allowance. Reconsideration and allowance are respectfully requested.

The Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 25-0120 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17.

Respectfully submitted,

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